431/344

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 322 674**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88121034.8**

(51) Int. Cl.4: **F23Q 2/16 , F23Q 2/46**

(22) Date of filing: **15.12.88**

(30) Priority: **28.12.87 JP 197399/87 U**

(43) Date of publication of application:
05.07.89 Bulletin 89/27

(84) Designated Contracting States:
DE FR

(71) Applicant: **Tokai Corporation**
2181-7, Enokiyado Kita-hassaku-cho
Midori-ku Yokohama(JP)

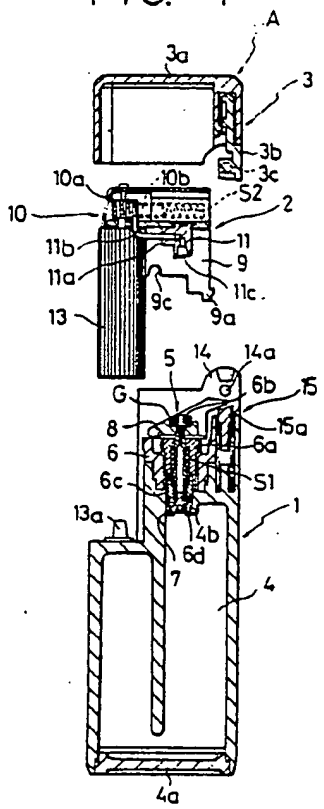
(72) Inventor: **Nitta, Tomio c/o Tokai Corporation**
2181-7, Enokiyado Kita-hassaku-cho
Midori-ku Yokohama(JP)

(74) Representative: **Wächtershäuser, Günter, Dr.**
Tal 29
D-8000 München 2(DE)

(54) Gas lighter.

(57) Disclosed is an improvement of gas lighter of the type which comprises a main body having a gas well, a gas-ejection nozzle fixed to the ceiling of the gas well, a cap operatively connected to the gas-ejection nozzle, and a fire-striking unit having a rotatable file and an associated flint. Such a gas lighter in improved in that the fire-striking unit has a connecting pipe under its bottom surface, the pipe communicating with the gas-ejection nozzle at its rear end and being open at its top end in the vicinity of the rotatable file. The building-in of the connecting pipe on the lower sufrace of the fire-striking unit permits reduction of the number of parts to be handled in the assembling line.

FIG. 1



EP 0 322 674 A1

GAS LIGHTER

The present invention relates to a gas lighter.

In general, many small parts are assembled into a gas lighter.

As for a gas lighter of the type which uses a fire-striking unit with a rotatable file adapted to rotate in a horizontal plane, the gas ejection nozzle is located apart from the flame opening, and therefore a pipe is used to connect the ejection nozzle to the flame opening. The pipe is a separate, independent part, requiring one extra assembling step. The work of building a pipe into the assembled structure requires skillfulness. For these reasons the building-in of this small part in the gas lighter structure is one cause for making it difficult to perform assembling work continuously with an increased efficiency.

In view of this one object of the present invention is to provide an improved gas lighter of the type which uses a fire-striking unit with a rotatable file adapted to rotate in a horizontal plane, permitting necessary assmebling work to be continuously efficiently performed by reducing the number of parts to be manually built in, and accordingly simplifying the assembling line.

To attain the object of the present invention a gas lighter of the type which comprises a main body having a gas well, a gas-ejection nozzle fixed to the ceiling of the gas well, and a cap operatively connected to the gas-ejection nozzle; and a fire-striking unit fixed to the top of the main body and having a rotatable file adapted to rotate in a horizontal plane, is improved according to the present invention in that the fire-striking unit has a pipe under its bottom surface, the pipe communicating with the gas-ejection nozzle at its rear end and being open at its top end in the vicinity of the rotatable file.

With this arrangement the pipe will be automatically put in connection to the gas-ejection nozzle simply by fitting the fire-striking unit in the top space of the main body.

Other objects and advantages of the present invention will be understood from the following description of a gas lighter according to one embodiment of the present invention, which is shown in the accompanying drawings:

Fig. 1 is an exploded longitudinal section of a lighter according to one embodiment of the present invention;

Fig. 2 is an exploded side view of the gas lighter; and

Fig. 3 is a perspective exploded view of the gas lighter.

In the drawings "A" indicates a gas lighter of the type which comprises a main body 1, a fire-striking unit 2 having a rotatable file 10a adapted to rotate in a horizontal plane and a cap 3. The main body is made of plastics, and has a gas well 4. A gas-ejection nozzle 5 is fixed to the ceiling of the gas well, and the cap 3 operatively connected to the gas-ejection nozzle 5. The fire-striking unit 2 is fixed to the top of the main body 1.

The main body 1 has a bottom closure 4a. A top closure 6 has an opening in alignment with the opening 4b of the ceiling of the gas well 4, and the lower part of the gas ejection nozzle 5 is inserted in these aligned openings. The gas-ejection nozzle 5 is composed of an outer hollow cylinder 6a threadedly engaged with the top closure 6, a gas-ejection pipe 6b vertically movably fitted in the outer hollow cylinder 6a with its tip end projecting from the upper surface of the outer hollow cylinder 6a, and an inner hollow cylinder 6c inserted at its top end in the bottom of the outer hollow cylinder 6a and at its bottom end in the opening 4b of the ceiling of the gas well 4.

The gas-ejection pipe 6b is biased by a spring S1 down to the lower position in which its movable rubber 7 closes the aperture 6d of the inner hollow cylinder 6c.

An operating lever 8 is fixed to the tip end of the gas-ejection pipe 6b via a rubber ring G. The operating lever 8 has opposite pivot projections 8a at its front end, and opposite catch extensions 8b at its rear end.

The fire-striking unit 2 is composed of a holder 9, a fire-striking mechanism 10 and a connecting pipe assembly 11. The holder 9 is made of plastics, and has a "U"-shaped section with catch hooks 9a integrally connected to its bottom corners. The holder 9 can be fixed to the main body 1 with its catch hooks 9a caught by the catch slots 9b of the top closure 6.

As shown, the holder 9 has opposite reentrances 9c made at its lower front, and when the fire-striking unit 2 is fixed to the main body 1, the opposite pivot projections 8a of the operating lever 8 are snugly accommodated in these reentrances 9c of the holder 9, thereby permitting the operating lever 8 to rotate a little about its pivot 8a for raising the gas-ejection pipe 6b when the cap 3 is opened.

An inner cap 12 is made of metal, and it has a flame opening 12a and a connection pipe assembly 11 fixed to its lower surface.

The connecting pipe assembly 11 is composed of an "L"-shaped pipe 11b and an "L"-shaped connector 11a. The "L" shaped connector 11a has a through channel 11c opening at its opposite

ends. The pipe 11b is inserted into the upper outlet of the channel with its one leg upright. The connector 11a is fixed to the lower surface of the bottom of the fire-striking unit 2. Thus, when the holder 9 is fixed to the main body 1, the connector 11a will be set on the gas-ejection pipe 6b. Then, it is fitted in the lower inlet of the channel 11c of the connector 11a. At the same time, the free end of the pipe 11b is put in the vicinity of the fire-striking unit 10. This particular way of fixing a pipe to the underside of the fire-striking unit in the holder should not be understood as being limitative. It is important that the pipe is fixed to the underside of the fire-striking unit in holder in right position, no matter how the pipe is fixed to the underside of the fire-striking unit. The pipe can be fixed to the fire-striking unit in different ways.

The fire-striking machanism 10 comprises a rotatable file 10a and a flint 10b. The file 10a is located adjacent to the flame opening 12a, and is adapted to rotate in a horizontal plane. The flint 10b is pushed against the file by spring S2.

The rotatable file 10a is connected coaxially to a rotary cylinder 13, which is to be rotatably fixed to the main body 1. When the rotary cylinder 13 is rotated, the gas ejected from the connecting pipe 11 is ignited.

The fire-striking unit 2 can be intergrally combined with the main body 1 by pushing and fitting the fire-striking unit 2 in the main body 1 to permit the catch hooks 9a of the holder 9 to be caught by the catch slots 9b of the top closure 6, and then the rotary cylinder 13 is put on the shoulder of the main body 1 with its projection 13a inserted in the center counter hole of the rotary cylinder 13.

When the fire-striking unit 2 is integrally combined with the main body 1, the connecting pipe 11 is put in connection to the gas-ejection nozzle 5.

The cap 3 comprises a metal enclosure 3a to cover the fire-striking unit 2, and a support piece 3b, which is inserted into the rear slot of the metal encloure 3a. The support piece 3b has pivots 3c projecting from its opposite sides. These pivots 3c are inserted in the holes 14a which are made on the opposite rear upper extentions 14 of the main body 1. Thus, the cap 3 is rotatably fixed to the main body 1 with its support piece 3b abutting on a lock 15 and a spring-biased push pin 15a. The cap 3 can be rotated about its pivot 3c between opening and closing positions.

As shown the support piece 3b has a recessed portion 3d. The rear extension 8b of the operating lever 8 is caught by the recessed portion 3d of the support piece, and therefore the operating lever 8 is rotated to raise the gas-ejection pipe 6b for ejection of gas when the cap 3 is opened.

As may be understood from the above, the building-in of the connecting pipe on the lower surface of the bottom of the fire-striking unit permits reduction of the number of parts to be manually handled in the assembled line, and accordingly simplifying the asembling work and increasing the efficiency with which necessary parts are assembled.

This contributes to the increase of continuity in the automatic assembling work by eliminating the necessity of manualy handling a selected part, and accordingly reduction of manufacturing cost.

Claims

1. A gas lighter of the type which comprises a main body having a gas well, a gas-ejection nozzle fixed to the ceiling of the gas well, and a cap operatively connected to the gas-ejection nozzle; and a fire-striking unit fixed to the top of the main body and having a rotatable file adapted to rotate in a horizontal plane, characterized in that the fire-striking unit has a pipe under its bottom surface, the pipe communicating with the gas-ejection nozzle at its rear end and being open at its top end in the vicinity of the rotatable file.

FIG. 1

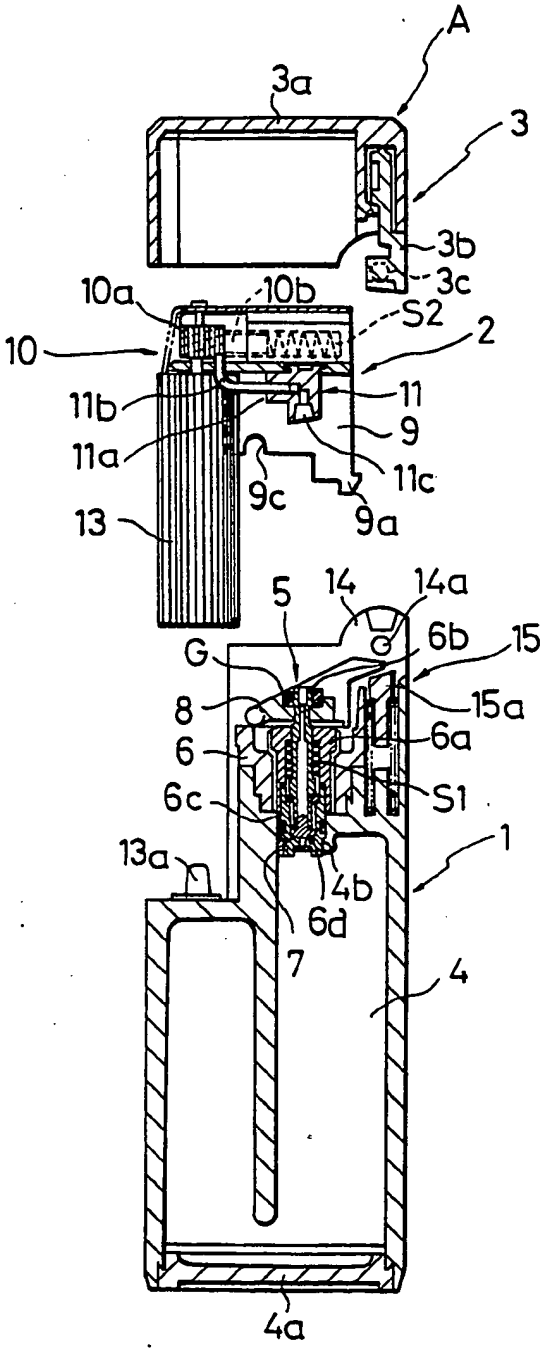

A
3a
3
3b
3c
10a
10b
S2
2
10
11b
11
11a
9
11c
9c
9a
13
5
14
14a
6b
15
G
15a
8
6a
6
S1
6c
1
13a
4b
6d
7
4
4a

FIG. 2

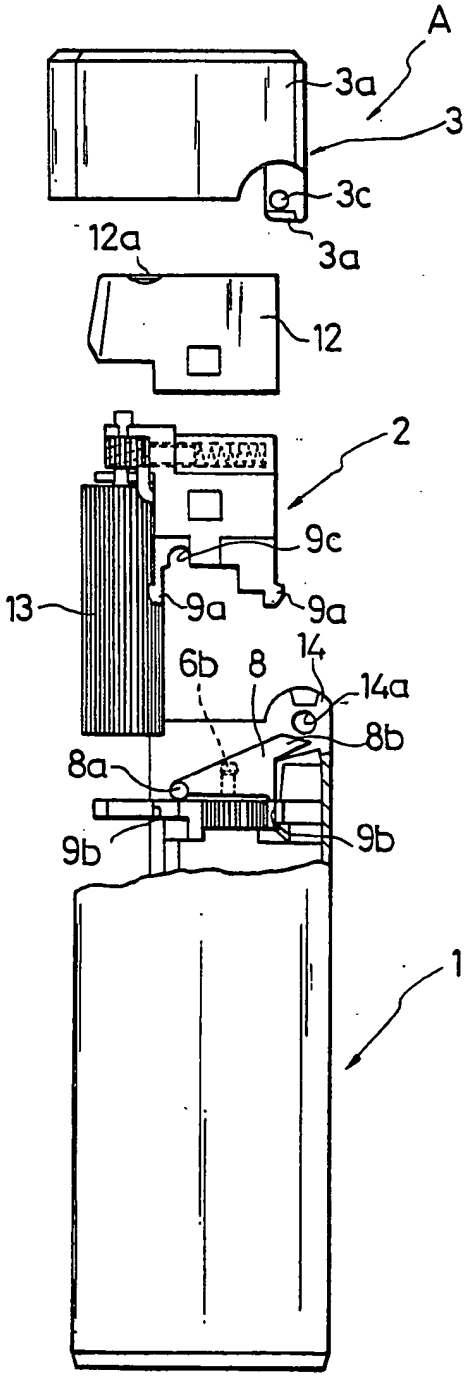
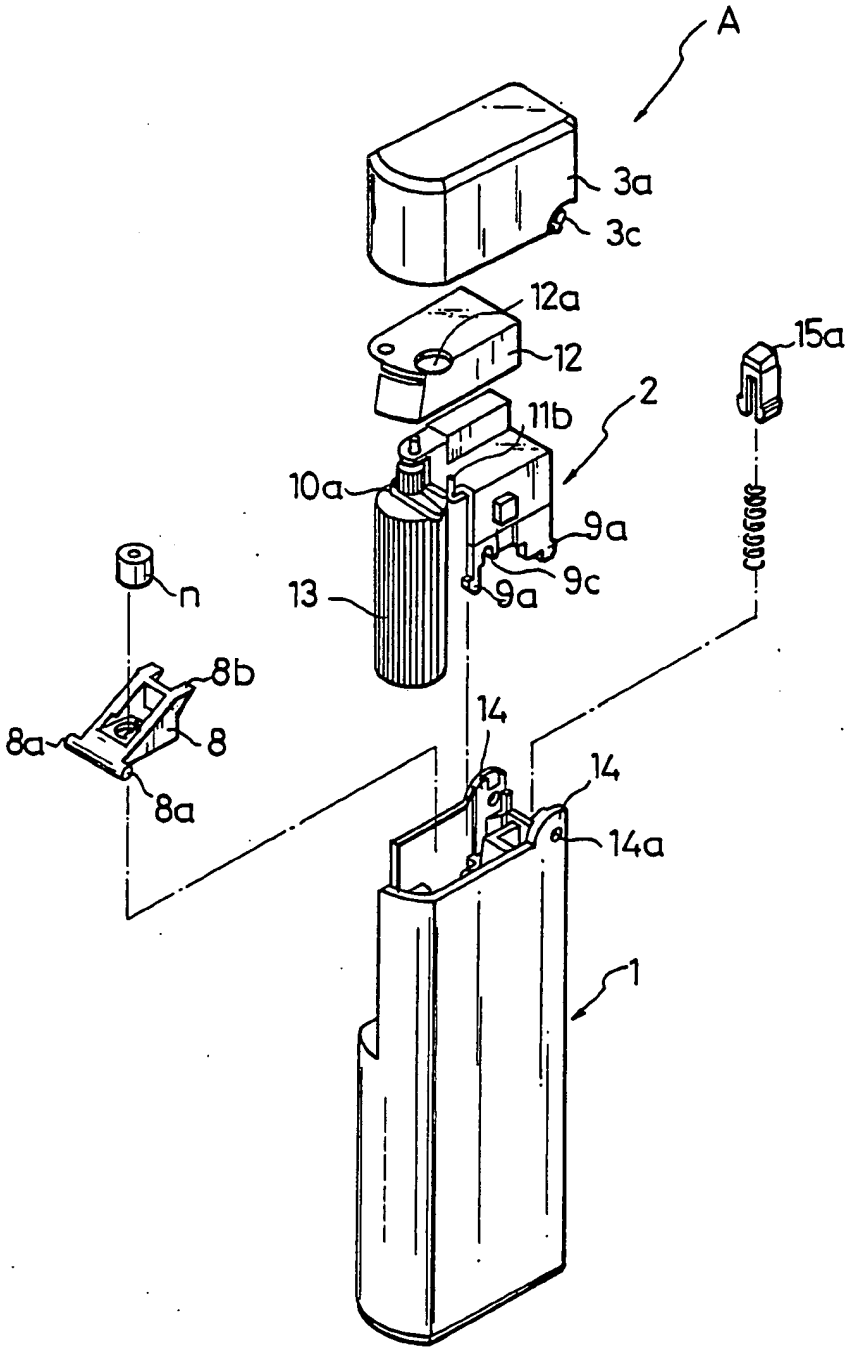

A
3a
3
3c
3a
12a
12
2
9c
13
9a
9a
6b
8
14
14a
8b
8a
9b
9b
1

FIG. 3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 12 1034

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	FR-A-2 412 033 (NIPPON GAS) * Page 4, lines 6-15; page 5, lines 1-13; figures * ---	1	F 23 Q 2/16 F 23 Q 2/46
A	DE-B-2 754 639 (ROWENTA) * Whole document * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

F 23 Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	05-04-1989	VANHEUSDEN J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)